

Sub 1
B
A1
a channel of a first conductivity type formed on a surface layer of a semiconductor substrate;

a source and a drain of a second conductivity type formed on both sides of the channel;

a gate insulation film with a first relative permittivity formed at least on said channel directly or through a buffer insulation film;

a gate electrode formed on said gate insulation film; and

a side insulation film formed at least on a side of said gate insulation film and having a second relative permittivity which is smaller than the first relative permittivity, wherein

when a first area of said gate insulation film, the first area being adjacent to said gate electrode, is S_1 , and a second area thereof, the second area being adjacent to said channel, is S_2 , the area S_1 is larger than the area S_2 , and an area of a bottom part of said gate electrode in contact with the gate insulation film is larger than S_1 .

A2
6. (Amended) The semiconductor device according to Claim 1, wherein a sectional shape of said gate insulation film along a direction from the gate electrode to said channel is one of a tapered shape, a trapezoid, a sector, and a stair.

Sub 2
B2
A3
9. (Amended) A semiconductor device comprising:

a channel of a first conductivity type formed on a surface layer of a semiconductor substrate;

a source and a drain of a second conductivity type formed on both sides of the channel;

a gate insulation film with a first relative permittivity formed at least on said channel directly or through a buffer insulation film;

a gate electrode formed on said gate insulation film; and

Sub B2
a side insulation film formed at least on a side of said gate insulation film and having a second relative permittivity which is smaller than the first relative permittivity,

wherein an electric flux density in said gate insulation film on a side towards the channel side is more dense than an electric flux density in said gate insulation film on a side towards the gate electrode, and an area of a bottom part of said gate electrode in contact with the gate insulation film is larger than an area of an upper part of said gate insulation film.

10. (Amended) A semiconductor device comprising:

A3
cont.
a plurality of first MOS transistors, each of said first MOS transistors including,

a first channel of a first conductivity type formed on a surface layer of a semiconductor substrate,

a first source and a first drain of a second conductivity type formed to both sides of said first channel,

a first gate insulation film with a first relative permittivity formed at least on the first channel directly or through a buffer insulation film,

a first gate electrode formed on said first gate insulation film, and

a first side insulation film formed at least on side of said first gate insulation film and having a second relative permittivity which is smaller than the first relative permittivity; and

a plurality of second MOS transistors, each of said second MOS transistors including,

a second channel of the first conductivity type formed on a surface layer of said substrate,

a second source and a second drain of the second conductivity type formed on both sides of said second channel,

a second gate insulation film with the first relative permittivity formed at least on said second channel directly or through a buffer insulation film,